there was great variety in the weather experienced in various parts of the country—*A. J. H.*

Meteorological summary for Chile, April, 1928 (by J. Bustos Navarrete, observatorio del Salto, Santiago Chile).—The circulation of the atmosphere was characterized by increasing activity; the paths of the depressions had a progressive movement toward the north and with this came the beginning of the rainy season in central Chile.

The depression of the 8th–9th affected conditions in southern and central regions and caused storms of wind and rain in the area from Chiloe to Coquimbo. The heaviest amounts, 4.30 to 5.50 inches, fell in the region between Curico and Talca. In all of that section of the cordillera there were heavy snowstorms which caused considerable damage. Between the 15th and 17th and again on the 18th–19th depressions crossed the southern region. In the first period the storms and rains extended to Talca and the excessive amount of 3.98 inches was recorded at Valdivia on the 16th; in the second period the rain area reached northward to Concepcion and there was another heavy 24-hour amount of 2.32 inches at Valdivia on the 19th. Depressions of minor importance affecting only the southern region, were charted on the following days: 3d–4th, 5th, 21st, and 27th

The important anticyclones were charted as follows: 1st–3d, in the region of Chiloe; 10th–14th, moving from the Juan Fernandez Islands through central Chile toward Argentina; 22d–25th, forming in the region of Chiloe and advancing toward northern Argentina; and, 30th, forming over southern Argentina.

At Santiago the total precipitation for the month was 1.21 inches, while at Valdivia it was 17.57 inches.—*Translated by W. W. R.*

Meteorological Summary for Brazil, April, 1928 (by Francisco de Souza, acting director Directoria de Meteorologia, Rio de Janeiro).—The depressions of the higher latitudes and that overlying the continent were about normal in activity.

The wind movement was lighter than in the preceding month; two storms of very moderate intensity passed over the extreme southern part of the country. The weather was rather unsettled, especially in the south, where precipitation was abundant. Temperatures were somewhat lower. Rainfall was extremely light, averaging 2.80 inches below normal in the northern region, but abundant in the central and southern regions, especially in the latter, where there was an average excess of 2.65 inches.

At some points in the north cotton and cereals were injured by pests or adverse meteorological conditions, but the general condition of the crops was not affected. Good yields of cereals, cotton, and cacao were obtained in the Amazonian region and in the central and southern States. Tobacco is being cut in the southern States. Harvesting of coffee has begun in the central and southern regions; yields are good.

At Rio de Janeiro the weather was fine on all except a few days. The mean cloudiness was slightly below normal and the duration of bright sunshine was 50 hours above the normal amount for the month. Mean maximum and mean minimum temperatures were above normal and there were 13 days on which the temperature exceeded 86° F. The prevailing winds were from the south quadrant; the mean velocity was 11.9 miles per hour and the extreme 44 miles per hour from the south-southeast during a storm in the early afternoon of the 25th.—*Translated by W. W. R.*

BIBLIOGRAPHY

C. FITZHUGH TALMAN, in Charge of Library

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Bertoni, Moisés S.
Memoria sobre la existencia de lluvias periódicas en determinados días del año. Un factor más para la previsión del tiempo. Puerto Bertoni. 1918. 78 p. 24½ cm.

Billwiller, R.
Klimatologie. Mit einem Anhang: Erdmagnetismus, von J. Maurer. Bern. 1927. xiv, 140, 9 p. 22½ cm. (Bibliog. der schweiz. Landesk., Fasz. IV.)

Brockmann-Jerosch, H.
Die Niederschlagsverhältnisse der Schweiz ... Zürich. 1925. p. 69–184. figs. plates (fold.) 23 cm. (Pflanzengeogr. Komm. der Schweiz. naturforsch. Gesellsch. Beiträge zur geobotanischen Landesaufnahme. Sonderab. H. 12, Vegetation der Schweiz.)

Eberle, Otto.
Die Verteilung der extremen Regenschwankungen über die Erde. Gotha. 1927. 50 p. plates (fold.) 28 cm. (Ergänzungsh. Nr. 195 zu "Petermanns Mitteil.")

Hellmann, G.
Die Entwicklung der meteorologogischen Beobachtungen bis zum Ende des XVIII Jahrhunderts. Berlin. 1927. 48 p. 27½ cm. (Abhandl. preuss. Akad. der Wissensch. Jahrg. 1927. Phys.-Math. Kl. Nr. 1.)

Hoffmeister, Johannes.
Untersuchung einiger Niederschläge von langer Dauer und weiter Verbreitung in Norddeutschland. Berlin. 1926. 33 p. figs. 31½ cm. (Inaug.-Dissert., Friedrich-Wilhelms-Univ.)

Hoxmark, Guillermo.
Granizo en la República Argentina. Buenos Aires. 1927. 1927. 35 p. figs. 23 cm.

International commission for the exploration of the upper air.
Report of the meeting in Leipzig, August 29–September 3, 1927. London. 1928. iv, 107 p. 24½ cm. (M. O. 300.)

International geodetic and geophysical union. Section of meteorology.
Troisième assemblée générale Prague—September 1927. Procès-verbaux des séances de la section de météorologie ... Rome. 1928. 104 p. 24½ cm.

International geodetic and geophysical union. Section scientific hydrology.
Réunion plénière de la section (Prague, Septembre 1927). Venezia. 1928. 67 p. 30½ cm. (Bulletin n. 12.)

Myrbach, Otto.
Haben die Leoniden einen Einfluss auf das Wetter? Kijiw. 1927. 11 p. figs. 26½ cm. (Sonderab.: "Inform. bull. des Ukrmets." Bd. 4–5, Jahr 1925–1926.)
Die Schwankungen der Grosswetterlage in ihrer Abhängigkeit von der Sonnentätigkeit nebst einem Anhang über die Alteration dieser Beziehungen durch die Mondphase. p. 217–288. figs. 27 cm. [Résumé in Russian.]

National underwriter. Hail and tornado insurance number. 1928. [New York.] 1928. 38 p. illus. 34½ cm.

Olufsen, O.
Mission O. Olufsen au Sahara 1922–23. Le climat du Sahara, observations météorologiques. Copenhague. 1926. 95 p. plates. map (fold.) 27 cm.

Suzuki, Seitaro.
Fires and the weather. 73 p. figs. plates. 27 cm. (Repr.: Journ. Dept. agric. Kyushu imp. univ., v. 2, no. 1, Mar. 20, 1928.)

Tacubaya. Observatorio astronómico nacional.
El Observatorio astronómico nacional en su quincuagésimo aniversario. Tacubaya. 1928. 28 p. plates. 19½ cm.

Tanaka, Kwan-ichi.
Experimental study on the effects of low barometric pressures and oxygen deprivation upon the efficiency of mental and physical work. p. 127–230. figs. plates (fold.) 26 cm. (Report Aeron. res. inst., Tôkyô imp. univ. v. 3, no. 7. March, 1928.)

Theaman, John R.
Rainfall tables for the island of New Guinea ... Indianapolis. 1928. ump. map. 28½ cm. [Typewritten.]

Ukraine. Meteorologischer Dienst.
Geophysikalische Characteristik der Ukraine unter allgemeiner Leitung des Director des Ukrmet's M. Danilevsky. Teil 3. Materiale des hydrologischen Dienstes Jahr 1924–1925 hidrol. Hydrometeorologie. Redactiert vom Vorstand des hydrologischen Dienstes Ing. S. Komarnitzky. Kyjiv. 1928. 58 p. plates. 31 cm.

U. S. Public health service.
Comparative tests of instruments for determining atmospheric dusts. Washington. 1925. iv, 69 p. figs. plates (part fold.) 23½ cm. (Pub. health bull. no. 144.)

SOLAR OBSERVATIONS

SOLAR AND SKY RADIATION MEASUREMENTS DURING MAY, 1928

By HERBERT H. KIMBALL, Solar Radiation Investigations

For a description of instruments and exposures and an account of the method of obtaining and reducing the measurements, the reader is referred to the REVIEW for January, 1924, **52**: 42, January, 1925, **53**: 29, and July, 1925, **53**: 318.

Table 1 shows that solar radiation intensities were slightly below the normal values for May at Lincoln, Nebr., and close to normal at Washington, D. C., and Madison, Wis. At Washington an intensity of 1.46 gr. cal. per minute per cm.^{2} measured at 10 a. m. of the 24th exceeds slightly the previous maximum for May at that station.

Table 2 shows that the total solar radiation received on a horizontal surface directly from the sun and diffusely from the sky was close to the May normal at Washington and decidedly above at Madison and Lincoln.

Skylight polarization measurements at Washington made on seven days give a mean of 54 per cent, with a maximum of 63 per cent on the 2d. At Madison measurements made on seven days give a mean of 58 per cent with a maximum of 68 per cent on the 12th. These are close to the corresponding average values for May for both stations.

TABLE 1.—*Solar radiation intensities during May, 1928*

[Gram-calories per minute per square centimeter of normal surface]

WASHINGTON, D. C.

Date	Sun's zenith distance: 8a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time (Air mass: A. M.)						P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	[1] 1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
May 2	6. 50			0. 89	1. 09	1. 36	0. 90	0. 62	0. 45		7. 29
May 4	8. 79		0. 58	0. 71	0. 91	1. 23	0. 78	0. 60	0. 33		8. 48
May 5	11. 38		0. 41	0. 58	0. 84	1. 23					10. 97
May 10	7. 87	0. 59	0. 69	0. 83	1. 05	1. 28					7. 87
May 11	10. 21						1. 00	0. 83			10. 21
May 12	5. 56						1. 20	1. 01	0. 84		5. 16
May 14	5. 79	0. 72	0. 84	0. 97	1. 18	1. 39	1. 09	0. 94			4. 57
May 15	7. 29			0. 71	0. 88						10. 21
May 24	6. 27				1. 16	1. 53					5. 16
May 30	10. 59				0. 89	1. 16					9. 83
May 31	8. 48				0. 98	1. 36	0. 97	0. 73			8. 18
Means		(0. 66)	0. 63	0. 78	1. 00	1. 32	0. 99	0. 79	0. 54		
Departures		+0. 02	−0. 08	−0. 04	+0. 01	+0. 04	±0. 00	±0. 00	−0. 12		

TABLE 1.—*Solar radiation inteniities during May, 1928*—Contd.

MADISON, WIS.

Date	Sun's zenith distance: 8a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time (Air mass: A. M.)						P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
May 1	6. 02				1. 17	1. 42					6. 50
May 5	6. 27				1. 21	1. 41					4. 37
May 7	4. 37				1. 24						3. 81
May 9	6. 50				0. 85	1. 25					7. 04
May 11	4. 57				1. 06	1. 50					3. 30
May 12	3. 99				1. 27	1. 43					3. 45
May 23	6. 50				0. 76	1. 20					7. 04
May 28	5. 79					1. 39					6. 02
May 29	6. 76				1. 18	1. 40					6. 50
Means					1. 09	1. 38					
Departures					−0. 02	+0. 02					

LINCOLN, NEBR.

May 1	3. 45			0. 84	1. 10	1. 32					4. 75
May 4	6. 50						1. 17				6. 50
May 5	5. 36		0. 83	0. 97	1. 16						3. 81
May 9	9. 14	−0. 61	0. 72	0. 87	1. 06	1. 32					9. 14
May 19	8. 81		0. 81	0. 97	1. 17	1. 42	1. 09	0. 86	0. 74		6. 27
May 21	5. 41		0. 93	1. 10	1. 25	1. 43	1. 20	0. 97	0. 82		5. 16
May 22	6. 76			0. 73	1. 00						6. 02
May 23	8. 81			0. 44	0. 64						8. 48
May 25	7. 87		0. 72	0. 81							6. 27
May 29	8. 81		0. 75	0. 90	1. 15						6. 76
May 30	10. 21			0. 92	1. 10	1. 30					9. 14
Means		(0. 61)	0. 79	0. 86	1. 07	1. 36	1. 15	(0. 92)	(0. 78)		
Departures		−0. 09	−0. 02	−0. 08	−0. 06	−0. 02	+0. 04	+0. 01	−0. 01		

[1] Extrapolated.

TABLE 2.—*Solar and sky radiation received on a horizontal surface*

[Gram-calories per square centimeter of horizontal surface]

Week beginning—	Average daily radiation: Washington	Madison	Lincoln	Chicago	New York	Average daily departure from normal: Washington	Madison	Lincoln
1928	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Apr. 29	563	462	514	409	385	+105	+11	+21
May 6	418	606	567	498	426	−31	+138	+92
May 13	459	414	433	319	356	−7	−60	−83
May 20	361	581	638	463	304	−116	+97	+89
May 27	553	531	528	447	411	+57	+49	+13
Excess or deficiency since first of year on June 2						−560	+2, 737	+1, 183